# EPA Region 7 TMDL Review

**TMDL ID:** NE-LP1-20700 **State:** NE
**Document Name:** SHELL CREEK

**Basin(s):** MISSOURI -LOWER PLATTE
**HUC(s):** 10200201
**Water body(ies):** SHELL CREEK
**Tributary(ies):** ELM CREEK, LOSEKE CREEK, NORTH SHELL CREEK
**Pollutant(s):** ATRAZINE

**Submittal Date:** 6/26/2007 **Approved:** Yes

**Submittal Letter**

*State submittal letter indicates final Total Maximum Daily Load(s) (TMDL) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by EPA, date of receipt of any revisions, and the date of original approval if submittal is a phase II TMDL.*

The TMDL for Shell Creek was formally submitted by the Nebraska Department of Environmental Quality (NEDQ) in a letter received on June 26, 2007.

**Water Quality Standards Attainment**

*The water body's loading capacity (LC) for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards (WQS) [40 CFR § 130.7(c)(1)]. A statement that WQS will be attained is made.*

The TMDL target is based on the numeric water quality criteria associated with the Class B warm water aquatic life beneficial use.

The water quality criteria established for the Class B warm water aquatic life protection of the beneficial used can be found in the Title 117, Chapter 4. Assessment of the data and the TMDL are based on the chronic criterion of 12 ug/L. The load allocation (LC) assigned will be based on the stream flow volume and is defined by:

$$LC = Flow \times 12\ ug/l \times C$$

This TMDL will result in the attainment of applicable Water Quality Standard (WQS).

**Numeric Target(s)**

*Submittal describes applicable WQS, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the*

*process used to derive the target is included in the submittal.*

The pollutant causing the impairment of the WQS and designated beneficial use is atrazine. Designated uses assigned to the above identified segments include: primary contact recreation; aquatic life Warmwater class B; agriculture supply Class A; and aesthetics (NDEQ 2006b). Excessive atrazine has been determined to be impairing the aquatic life beneficial use. Assessment of the data and the TMDL are based on the chronic criterion of 12 ug/l. Based on the data assessment process a seasonal concern/impairment (May-June) exists for atrazine. Because the impairment is seasonal, this TMDL will focus on that period.

**Pollutant(s) of concern**

*An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety (MOS) that do not exceed the LC. If submittal is a phase II TMDL there are refined relationships linking the load to WQS attainment. If there is an increase in the TMDL there is a refined relationship specified to validate the increase in TMDL (either load allocation (LA) or waste load allocation (WLA)). This section will compare and validate the change in targeted load between the versions.*

The TMDL target is based on the numeric water quality criteria for atrazine of 12 ug/l. The WLA and natural background is set at zero (0). The LA is based on stream flow volume. The entire LC is the LA, an example at the 50% flow, the LA would be 1.1 kg/day atrazine.

**Source Analysis**

*Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered. If this is a phase II TMDL any new sources or removed sources will be specified and explained.*

Atrazine is one of the most heavily used pesticides in North America (EPA 2003). Given this usage and source, point and natural sources are likely not contributing Atrazine to surface waters in Nebraska. Therefore, for this TMDL the entire load will be considered the result of nonpoint source discharges. All significant sources have been considered at this time.

**Allocation - Loading Capacity**

*Submittal identifies appropriate WLA for point, and load allocations for nonpoint sources. If no point sources are present the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2(i)]. If this is a phase II TMDL the change in LC will be documented in this section.*

A TMDL is defined as: TMDL = LC = WLA + LA + Background + MOS

The LC is based upon flow position in the hydrograph and is defined by:

$$LC = \text{Flow} \times 12 \text{ ug/l} \times C$$

The TMDL target is based on the numeric water quality criteria for atrazine of 12 ug/l. The load allocations assigned to this TMDL will be based on the stream flow volume and is defined by:

$$LA = Flow \times 12\ ug/l \times C$$

The entire LC = LA, and example at the 50% flow would be 1.1 kg/day atrazine.

**WLA Comment**

*Submittal lists individual WLAs for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to WQS excursions, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLAs. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a phase II TMDL any differences in phase I and phase II WLAs will be documented in this section.*

WLA for facilities classified as non-discharging is zero (0).
WLA for atrazine is zero (0).

**LA Comment**

*Includes all nonpoint sources loads, natural background, and potential for future growth. If no nonpoint sources are identified the LA must be given as zero [40 CFR § 130.2(g)]. If this is a phase II TMDL any differences in phase I and phase II LAs will be documented in this section.*

The LA assigned to this Atrazine TMDL is based upon the stream flow volume and will be defined as:

$$LA = Q*12\ ug/l*C$$

Because the WLA and natural background are zero (0) the entire loading capacity is the LA and can be found in Appendix B of the TMDL, which is reproduced below.

B-0-100$^{TH}$ Percentile Flows and Maximum Daily Loadings for Shell Creek

| **Ranking/ Percentile** | Flow Value (cfs) | MAXIMUM DAILY LOAD (KG/DAY) |
|---|---|---|
| 0 | 10 | 0.29 |
| 10 | 19 | 0.56 |
| 20 | 25 | 0.73 |
| 30 | 29 | 0.85 |
| 40 | 33 | 1 |
| 50 | 37 | 1.1 |
| 60 | 43 | 1.3 |
| 70 | 55 | 1.6 |
| 80 | 84 | 2.5 |
| 90 | 194 | 5.7 |
| 100 | 4900 | 144 |

**Margin of Safety**

*Submittal describes explicit and/or implicit MOS for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a phase II TMDL any differences in MOS will be documented in this section.*

This TMDL contain an implicit margin of safety. The reduction necessary to support the

beneficial use will be set at 55% whereas only a 45% reduction is needed to meet full support status. Also, implementation of controls will result in year – round protection of water quality. This will be important should application practices change in the future.

**Seasonal Variation and Critical Conditions**

*Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL (s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of WQS. If this is a phase II TMDL any differences in conditions will be documented in this section.*

The critical environmental conditions for this TMDL for atrazine have been identified in the assessment process. Specifically, the data and information will be limited to the May through June time frame when the deviations from the water quality criteria were observed.

**Public Participation**

*Submittal describes required public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].*

The availability of the TMDLs in draft form was published in the Columbus Telegram and other newspapers with the public comment period running from approximately May 14, 2007 to June 18, 2007. This TMDL was also made available to the public on the NDEQ's internet site and interested stakeholders were informed via email of the availability of the draft TMDL. No comments were received during the public participation period.

**Monitoring Plan for TMDL(s) Under Phased Approach**

*The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used) [40 CFR § 130.7].*

Future monitoring will generally be consistent with the ambient stream monitoring network. That is, a site continues to be maintained on Shell Creek. As well, an effort will be made to expand the monitoring to isolate areas of concern and to focus resources to address identified problems.

**Reasonable Assurance**

*Reasonable assurance only applies when less stringent WLAs are assigned based on the assumption of nonpoint source reductions in the LA will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads.*

Reasonable assurances do not apply as the WLA is zero. The submittal does list nonpoint pollutants authority.